

AMENDMENTS TO THE CLAIMS

The current listing of the claims replaces all previous amendments and listings of the claims.

1. (Currently Amended) An outer tube, which is made of silicon carbide, and which has an upper portion closed and a lower portion opened, has the lower portion formed with a tapered portion so as to expand a diameter thereof toward a lower end thereof, and has a flange formed on an outer peripheral side of the lower portion; the following conditions being met:

- 1) a ratio of t_a/D_1 is from 0.0067 to 0.025,
- 2) a product of $t_a \times D_1$ is from 600 to 4,000 (mm^2),
- 3) $(D_{F2}-D_{F1}) \times t_c / (D_1 \times t_a)$ is from 0.1 to 0.7, and
- 4) L_1/L_2 is from 1 to 10;

where the outer tube has a thickness of t_a (mm) and an inner diameter of D_1 (mm), the flange has a thickness of t_c (mm), an inner diameter of D_{F1} (mm) and an outer diameter of D_{F2} (mm), and the tapered portion has a height L_1 (mm) and an expanse of L_2 (mm), and where the outer tube is configured to be used in a thermal treatment system.

2. (Original) The outer tube according to Claim 1, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

3. (Original) The outer tube according to Claim 1, wherein the tapered portion has an inner surface having a surface roughness Ra of not greater than 7 μm .

4. (Original) A thermal treatment system using an outer tube, which is made of silicon carbide, and which has an upper portion closed and a lower portion opened, has the lower portion formed with a tapered portion so as to expand a diameter thereof toward a

lower end thereof, and has a flange formed on an outer peripheral side of the lower portion;
the following conditions being met:

- 1) a ratio of t_a/D_1 is from 0.0067 to 0.025,
- 2) a product of $t_a \times D_1$ is from 600 to 4,000 (mm^2),
- 3) $(D_{F2} - D_{F1}) \times t_c / (D_1 \times t_a)$ is from 0.1 to 0.7, and
- 4) L_1/L_2 is from 1 to 10;

where the outer tube has a thickness of t_a (mm) and an inner diameter of D_1 (mm), the flange has a thickness of t_c (mm), an inner diameter of D_{F1} (mm) and an outer diameter of D_{F2} (mm), and the tapered portion has a height L_1 (mm) and an expanse of L_2 (mm).

5. (Original) The thermal treatment system according to Claim 4, wherein the tapered portion has upper and lower edges of an inner peripheral side rounded with a radius of 2 mm (R2) or above.

6. (Original) The thermal treatment system according to Claim 4, wherein the tapered portion has an inner peripheral side having a surface roughness R_a of not greater than 7 μm .

7. (Original) The thermal treatment system according to Claim 4, wherein the height L_1 of the tapered portion satisfies the relationship of $H/4 < L_1 < 3 \cdot H/4$, where a distance between a lowest end of a heater and a bottom surface of the outer tube is H (mm).